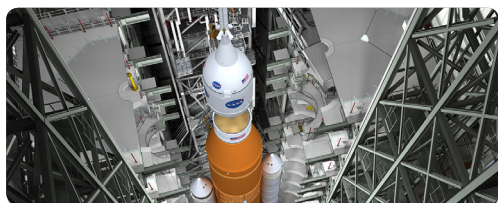




# GSDO

GROUND SYSTEMS  
DEVELOPMENT & OPERATIONS

## EXPLORATION BEGINS HERE



### PROGRAM HIGHLIGHTS • JANUARY 2016

At NASA's Kennedy Space Center in Florida, the Ground Systems Development and Operations (GSDO) Program Office is leading the center's transformation from a historically government-only launch complex to a spaceport bustling with activity involving government and commercial vehicles alike. GSDO is tasked with developing and using the complex equipment required to safely handle a variety of rockets and spacecraft during assembly, transport and launch. For more information about GSDO accomplishments happening around the center, visit <http://www.nasa.gov/groundsystems>.

## 2015 a Busy and Productive Year for GSDO

The year 2015 could be described as a very busy and productive year for the Ground Systems Development and Operations (GSDO) Program at Kennedy Space Center. The team was focused on continuing to prepare our launch infrastructure, facilities, ground systems and operational processes that will become the springboard for our journey to Mars.

We completed the structural modifications to the mobile launcher that provides the platform and launch tower for NASA's Space Launch System rocket and the Orion spacecraft.

Three of 10 levels of work platforms for the Vehicle Assembly Building, K, J and H, arrived at the center. The first half of the K-level work platforms was installed in High Bay 3.

Several of the umbilical lines that will connect from the mobile launcher tower to the rocket and spacecraft are being tested at the Launch Equipment Test Facility.



We are developing a state-of-the-art command and control system for Firing Room 1 in the Launch Control Center. Modifications and installation of ground support equipment are nearly complete in the Multi-Payload Processing Facility where we will service and de-service the Orion spacecraft.

Work began to tune up the massive crawler-transporter that will carry the Space Launch System and Orion spacecraft atop the mobile launcher to Launch Pad 39B for Exploration Mission-1.

We have a busy year ahead with many more milestones to complete. And we have to be ready because, in less than two years, the most powerful rocket in the history of the world is going to show up here on our doorstep.

"Exploration begins here" are more than just words. They are a reality at Kennedy Space Center. And GSDO is "go."

-- Mike Bolger  
GSDO Program Manager



# First Work Platform Installed in Vehicle Assembly Building

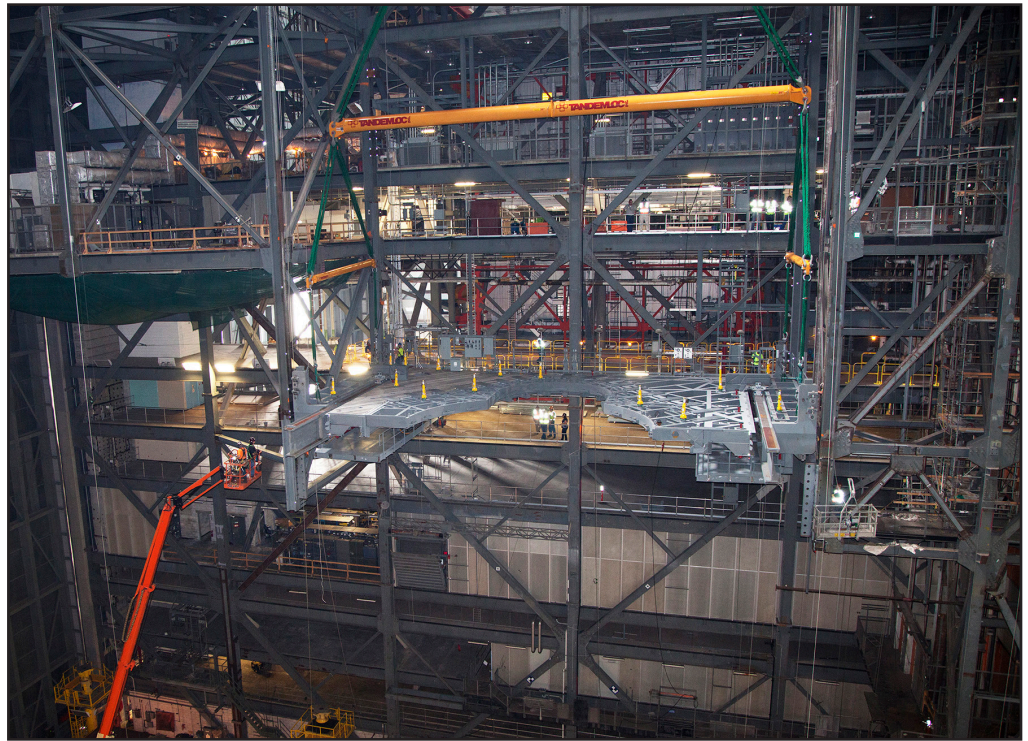
The first of 10 work platforms that will provide access to NASA's Space Launch System (SLS) rocket has been installed inside the Vehicle Assembly Building (VAB) at NASA's Kennedy Space Center in Florida. When the SLS arrives at Kennedy for processing prior to launch, it will be housed in the VAB atop the mobile launcher and will stand more than 350 feet above the ground. Engineers are installing platforms at key points along the body of the rocket to provide access needed for launch preparations.

An overhead crane that can hold as much as 325 tons was used to lift the first half of the K-level work platforms from High Bay 4 through an opening in the divider between the bays approximately 19 stories up, across the transfer aisle, and then lowered it into High Bay 3.

The platform was secured into position, about 86 feet above the VAB floor, or nearly nine stories high. The K-level work platform halves will provide access to the SLS core stage and solid rocket boosters during processing and stacking operations on the mobile launcher.

A total of 10 levels of new platforms -- 20 platform halves altogether -- will surround the SLS rocket and Orion spacecraft and provide access for testing and processing. The giant steel platforms, each measuring 38 feet long and 62 feet wide, will be attached to rail beams that will provide structural support and contain the drive mechanisms to move them in and out or up and down as needed.

The Ground Systems Development and Operations Program is overseeing upgrades and modifications to the VAB, including installation of the new work platforms, marking preparations for the agency's journey to Mars.



*Inside the Vehicle Assembly Building at Kennedy Space Center, a 325-ton crane lifts the first half of the K-level work platforms up for installation in High Bay 3 on Dec. 22. The platform was secured into position on tower E, about 86 feet above the floor. Photo credit: NASA/Ben Smegelsky*



*A 325-ton crane is used to lift the first half of the K-level work platforms for NASA's Space Launch System (SLS) into position in High Bay 3 on Dec. 22. Photo credit: NASA/Glen Benson*

**View a video of the platform installation at**  
**[https://www.youtube.com/watch?v=Yn7\\_4GRqt0k](https://www.youtube.com/watch?v=Yn7_4GRqt0k)**

# Critical Design Review Marks Progress for Journey to Mars

NASA's Ground Systems Development and Operations Program (GSDO) has successfully completed its critical design review, on the path to preparing for the agency's journey to Mars.

Members of the review board completed their in-depth assessment of the plans for the facilities and ground support systems at Kennedy Space Center in Florida that will be needed to process NASA's Space Launch System (SLS) rocket and Orion spacecraft for deep-space exploration missions. A Standing Review Board composed of aerospace experts from NASA and industry also will provide an independent assessment. Results of the review process will be briefed to senior agency officials in the coming months as the last step in the process.

"The completion of this review represents a critical milestone for the GSDO team that clearly demonstrates we are on track with the launch site upgrades required to support SLS and Orion test, checkout and launch in 2018," said Mike Bolger, GSDO program manager.

The SLS will be the most powerful rocket in the world and will launch astronauts in the agency's Orion spacecraft to destinations beyond Earth's orbit. Key elements of Kennedy's launch infrastructure will support a new era of human exploration on the journey to Mars.

Progress already can be seen around the center with work currently underway to prepare for the arrival of SLS and Orion.

To read the complete story, visit <http://go.nasa.gov/1JBovh>.



An artist illustration of NASA's Space Launch System rocket and Orion spacecraft on the mobile launcher at Launch Pad 39B at Kennedy Space Center. Image credit: NASA



Technicians assist as an oversized, heavy transport trailer, carrying the first half of the "G" level work platforms, proceeds toward the west side parking area of the Vehicle Assembly Building at NASA's Kennedy Space Center in Florida. The platform was transported Jan. 6, from Sauer Co. in Oak Hill, Florida. The Ground Systems Development and Operations Program is overseeing upgrades and modifications to High Bay 3 to support processing of NASA's Space Launch System and Orion spacecraft, and other exploration vehicles. Photo credit: NASA/Ben Smegelsky

# New Tracking Station for Space Launch System Rocket Launches

Assembly of an advanced tracking antenna is nearing completion at NASA's Kennedy Space Center in Florida. It is both an important step toward the center's role as a 21st century multi-user spaceport and a crucial milestone in preparing to launch the agency's Space Launch System (SLS) rocket and Orion spacecraft.

The antenna is part of a new S-band ground tracking system, known as the Kennedy Uplink Station, located in the space center's industrial area. The new facility, along with a refurbished, identical counterpart north of Kennedy and other enhancements to existing Florida spaceport infrastructure, will form an integrated ground system providing crucial launch communications capabilities. In addition to SLS and Orion, the new ground system will support future civilian, military and commercial launches from Kennedy and Cape Canaveral Air Force Station.

While the NASA ground stations are located at and near Kennedy to support launches from the Florida spaceport, they will be operated remotely from the Wallops Flight Facility in Virginia as part of the agency's Near Earth Network. To meet all SLS and Orion requirements, the project also will deliver upgraded electronics to two Air Force stations and a down-range tracking site in Bermuda.

The crucial elements of the new



*A crane lowers a radome Dec. 10 to cover an S-band antenna at Kennedy Space Center. The antenna is designed to provide a crucial tracking capability following liftoff of NASA's Space Launch System rocket. A radome is a weatherproof structural enclosure designed to protect an antenna or radar system and is constructed of material that interferes minimally with the electromagnetic signal transmitted or received. The S-band portion of the microwave spectrum combines voice, television, telemetry, command, tracking and ranging into a single system. Photo credit: NASA/Dimitri Gerondidakis*

system will allow uninterrupted transmission of communications between the rocket-spacecraft combination and controllers at Kennedy, the Cape, Goddard Space Flight Center, the Johnson Space Center in Houston and the Marshall Space Flight Center in Huntsville, Alabama.

The new network, designed for launch support, includes the new S-band antenna site at Kennedy, as well

as an identical station at the Ponce De Leon Inlet Tracking Annex. The twin station is located in New Smyrna Beach, Florida, 35 miles north of Kennedy. The facility is being refurbished and modernized with an antenna system identical to the one at Kennedy, and will provide a crucial tracking capability following liftoff of the SLS.

To read the complete story, visit <http://go.nasa.gov/1mLqR2A>.



*An aft skirt similar to one that will be used on a solid rocket booster (SRB) for NASA's Space Launch System rocket, was transported by NASA and Jacobs engineers and technicians on the Test and Operations Support Contract on Jan. 20, to the Rotation, Processing and Surge Facility (RPSF) at NASA's Kennedy Space Center in Florida. At the RPSF, the aft skirt will be inspected and undergo limited processing to prepare for SRB pathfinder operations. The pathfinder operations will help to test recent upgrades to the RPSF facility as the center prepares for Exploration Mission-1, deep-space missions, and the journey to Mars. Photo credit: NASA/Bill White*

**Look for a feature on the SRB pathfinder operations in the RPSF in the next issue of GSDO Program Highlights.**

# Ground Systems Team Spotlight



**Lisa Waters** is the group manager for the Safety, Health and Environment (SH&E) organization with Jacobs on the Test and Operations Support Contract at Kennedy Space Center. Her main responsibilities include implementing and executing safety and environmental management systems for Jacobs, and providing support to SH&E customers.

Her team supports the Ground Systems Development and Operations Program at various sites around the center, including the Vehicle Assembly Building; Launch

Control Center; Launch Pad 39B; the Rotation, Processing and Surge Facility; and the Multi-Payload Processing Facility. They provide design, operations and engineering support, safety and environmental teams, recommendations, inputs and plans, product risk assessments, hazard report reviews, safety requirement document release, training and certification, and environmental reports.

"We interface with technicians, engineers, operations and management daily on real-time topics ranging from spider issues in facilities to visualization lab reviews of future operations in the Vehicle Assembly Building," Waters said.

Waters said the coolest part of her job is the people she works with.

"It's an honor and privilege to work with so many passionate, professional and dedicated individuals, all working toward the launch of Exploration Mission-1 and future human missions," Waters said.

Waters has worked at the center for 25 years, starting in 1990 with Lockheed Space Operations Company as part of safety operations for orbiter processing.

Her hometown is Benton, Kentucky, a small town in the western part of the state. She moved to Titusville in 1990.

Waters earned a Bachelor of Science in occupational safety and health in 1987 from Murray State University in Murray, Kentucky. She is just two courses away from obtaining her master's, also from Murray.

"We're never too old to learn new things," Waters said.

Her first car was a 1979 yellow Pontiac Firebird. Her hobbies include traveling and reading fiction and non-fiction books with a focus on history. One of her favorite trips was to Washington, D.C., where she visited the museums and historical sites.

She has been married to her husband, Dwayne, for 22 years. They have two sons, Joshua, 21, and Caleb, 19.

Their pets include Georgia, a two-year-old rescued Border collie and golden retriever mix, and Mac, a six-month-old rescued Siamese kitten with blue eyes.

**Randy Lane** is the technical lead for the Application Services Framework with Vencore on the Engineering Services Contract at Kennedy Space Center. His responsibilities include developing software that allows engineers to quickly develop complex scripts that monitor and command ground support equipment and eventually the Space Launch System rocket and Orion spacecraft.

"The coolest part of my job is getting to write the programs that will be used to launch the Space Launch System," Lane said.

He became interested in space while growing up on Merritt Island and watching rockets launch. His favorite memory is when he was five and his dad woke him up in the middle of the night to watch television. Even though he wanted to go back to sleep, his dad kept him up because it was the Apollo 11 moon landing, and Neil Armstrong was just about to walk on the moon.

"I thank my dad for the memory every chance I get," Lane said.

He has worked at Kennedy or at the Cape Canaveral Air Force Station since 1987. He interned for Computer Sciences Corp. in 1982, during the summer between high school and college. He has worked in various positions for Grumman, Rockwell, Boeing and United Launch Alliance (ULA).

In 2011, he left ULA to work for QinetiQ (which became Vencore).

Lane has always lived in Brevard County. He attended local schools, including Merritt Island High School. He earned a Bachelor of Science in computer science from the University of Central Florida in Orlando in 1986. In 1990, he received a master's in computer graphics from Florida Technological University in Melbourne, Florida.

Lane's first car was a 1987 blue Chevrolet Camaro with a stick shift. Years later, he traded it in for a pickup truck to help transport his windsurfer.

His hobbies include windsurfing and scuba diving. He also volunteers as a mentor for the FIRST robotics teams Horsepower 801, The Pink Team 233, and has worked at the Florida Regional competition. Other hobbies include reading and computer games.

"I am a computer nerd after all," Lane said.

He has been married to his wife, Jean, for 23 years. They have two daughters, Christine, 22, and Heather, 21. Lane and his wife met at the space center where they both worked in the Vehicle Assembly Building for different companies.

They have a dog named Scooter, who may be a Labrador, terrier and German shepherd mix.

"I cannot believe the amount of hair he sheds," Lane said. "He loves our pool more than we do so we think he may be part seal, too."

